European Journal of Open Education and E-learning Studies
ISSN: 2501-9120
ISSN-L: 2501-9120
Available on-line at: www.oapub.org/edu

doi: 10.5281/zenodo.1039316 Volume 2 | Issue 2 | 2017

ADOPTION OF E-LEARNING IN SAUDI ARABIAN UNIVERSITY EDUCATION: THREE FACTORS AFFECTING EDUCATORS

Omran Alharbi[1i],
Vic Lally[2]
[1]University of Glasgow, Glasgow, UK
[2]Prof., University of Glasgow, Glasgow, UK

Abstract:
Information and communication technology (ICT) is an important if not crucial trend in 21st century learning and education. The adoption of ICT as an educational process has led to improved teaching and learning processes, both inside and outside the classroom. Among the many advantages of ICT technology is that it allows students and teachers to communicate outside the classroom and utilise new techniques and skills. The adoption of ICT in teaching has undoubtedly improved learning and teaching processes, on the other hand there are some factors are hindering the successful implementation. This paper reviews the literature as it pertains to factors affecting effective application of eLearning for educators and students in educational institutions in Saudi Arabia Universities. Through a search of academic databases, 32 relevant literature studies and reviews were identified for the Saudi Arabian context; most were directly concerned with Saudi Arabia's higher education sector, while others country-specific studies were included when deemed appropriate. Based on the review the literature, this paper concluded that 'lack of time', 'lack of training' and 'lack of institutional support' were the major factors influencing faculty members' decision to adopt and utilise ICT in teaching practice. In terms of solutions to the challenges identified, reducing academic staffs' workload to allow them to have more time to use E-learning tools, alongside the provision of sufficient and practical training and institutional support for academic staff should be considered as essential to the successful implementation of technology in education.

[i] Correspondence: email king20014@hotmail.com

Keywords: Saudi Arabia, e-learning, e-learning adoption, ICT, remote learning, higher education, educators, university education

1. Introduction

1.1 E-learning and the adoption of ICT solutions in education

Information communication and technology (ICT) has brought about numerous benefits within the educational settings for students and teachers alike. In many countries across the world, universities have started to implement ICT learning, or E-learning, into their practices and curricula. Despite the significant and often optimistic speculation over the prospective impact it might have on learning and education, ICT integration and use—both inside and outside the classroom—has been smaller than expected (Mirzajani, Mahmud, Ayub, & Wong, 2015). Saudi Arabia is no exception, and the Kingdom has made considerable investments in trying to introduce E-learning and ICT into its education system (Jabli & Qahmash, 2013). Despite these investments into technical infrastructure, professional training and equipment however, the adoption of ICT and ICT approaches by educators at the University level has been limited (Almulhem, 2013; Al-Shammari, 2015). Acording to Hong & Songan, (2011) ICT has been shown to rise the quality of education by supporting educators perform their duties in line with enhanced efficiency of student learning and many governments have started to support this process by providing their universities with the necessary ICT equipment and training.

1.2 Aims and objectives

This paper will consider ICT technologies and E-learning in Saudi University education and investigate those factors affecting and influencing teachers regarding its adoption and use. It is hoped that this review will inform the relevant institutions and stakeholders as to why the adoption of E-learning in Saudi Universities by educators remains limited and slow. By identifying and highlighting those factors influencing educators regarding the adoption of ICT and e-learning in Saudi universities it is hoped that managers of the higher education institutions will be able to better remove those barriers preventing the ideal use of ICT.

This study will review existing literature and researches on factors affecting teachers' use of ICT for educational purposes. The literature reviewed will predominantly involve studies on Saudi Arabia's University teaching environment and E-learning in practice, though research on other educational systems shall also be included. More specifically, this article shall focus on three main factors affecting and

influencing academic staff's adaption of ICT in education and E-learning techniques. These factors are lack of time, lack of training and lack of institutional support. These factors have been chosen as they are most prominent in the field's extant literature (see Appendix 1).

The ministry of education in Saudi Arabia has appreciated and recognised the importance of ICT in the teaching and learning process. Subsequently, it has made considerable effort to reform the educational process of university education (Ministry of Education, 2017). On the other hand, the integration of E-learning and ICT educational technologies remains slow and minimal in Saudi universities, despite considerable investments made by the Saudi government to introduce ICT into the teaching and educational process (Al-Gamdi & Samarji, 2016; Quadri et al., 2017). This study will attempt to highlight and emphasise the elements that affect and influence educator's utilization of ICT in Saudi universities. Hence, reviewing the literature in terms of factors that affect and influence the teacher's adaption of technology in their teaching, can also help to highlight these challenges and then identify the best potential solutions to address them.

1.3 Outline of paper

This paper shall begin with an introduction of the problem to be investigated, namely, the adoption and integration of E-learning and ICT solutions into education within Higher Education University institutions in the Kingdom of Saudi Arabia. The aims and objectives of the paper shall then be outlined and the details of its subject matter and approach and method of investigation shall be expounded upon. Subsequently, the existing and historical integration of E-learning into the Saudi Arabian University system shall be explored regarding the success and effectiveness of this assimilation investigated. A brief history of E-learning and its adoption shall follow, after a discussion of the importance of integrating E-learning solutions to Universities in Saudi Arabia shall follow. The current situation of E-learning in Saudi Arabia Universities and the lack of success in this domain shall be compared and contrasted with existing studies on and around the subject, after which the three main factors to be investigated in this paper shall be outlined and explained. An exploration of each of these factors according to the literature consulted in the context of Saudi Universities and relevant recommendations of previous research studies shall follow. Next, a short discussion of the problems and barriers facing the integration of E-learning into Saudi university teaching practice and its adoption by University teachers shall be followed by an outline of the conclusions of this research. Finally, suggestions and recommendations for future research shall follow.

1.4 E-learning in Saudi Arabia

The government of Saudi Arabia has made the integration of E-learning tools in teaching and education a priority. Indeed, this agenda is clearly seen in the 'Saudi vision 2030' programme, in which one of the key goals is to ensure that in the future, five Universities in Saudi Arabia are among the top 200 Higher Education institutions worldwide. In the past the Saudi government has struggled to improve its education process by allocating funds and resources to increase its global standing and efficacy. As part of its ongoing endeavour, the Saudi Ministry of Education established the National Centre of E-learning and distance education in 2007 (Ministry of Education, 2017). The National Centre for E-learning and Distance Education offers several specialized training programmes in E-learning and distance education. These programmes have been developed periodically with the help of both Saudi and international experts in the E-learning field. One aim of this centre is to assist Saudi universities to introduce ICT in their educational environment and ensure that E-learning practices and platforms are integrated and adopted by students and teachers within the Saudi education system (Ministry of Education, 2017). Furthermore, the centre hopes to promote collaboration among the Saudi universities for training and support so that instructors can employ ICT educational solutions in their teaching and curricula. Several institutions are currently collaborating with the centre to integrate ICT-based teaching and learning processes into their *modus operandi*. One example of this is the Princess Noura University which has worked with the Centre to design and develop E-courses and training programmes for faculty members. Conversely, other universities have been more autonomous and have endeavoured to introduce and implement their own E-learning courses and solutions into their respective curricula by constructing their own deanship of E-learning. This deanship is responsible for designing and producing these E-content courses as well as training academics and students to use and adopt the new systems, and to encourage teachers to employ E-learning tools in their teaching practice. Examples of Saudi Universities taking this approach include Hail University, Al-Jouf University, King Abdoul Aziz University, Umm Al-Gura University, King Khalid University, and Al-Taif University.

2. Brief History of E-learning, its introduction to education Higher Education in Saudi Arabia

2.1 Historical account of ICT solutions and introduction to teaching practice

ICT and computers have been used by corporations, the military and education institutions to improve, enhance and support learning since the early 1960s (Nicholson,

2007; Cox, 2013). One of the first uses of an integrated ICT system to enhance learning was PLATO, a timeshared computer system used to support literacy and language education at the University of Illinois (Nicholson, 2007). PLATO was employed as a means by which educators and students could utilise TUTOR—an educational programming language—to interact with other users on the system and communicate through use of electronic messages. In this manner Nicholson (2007) believes it to be a forerunner of many conferencing systems used today. Personal computers were not truly integrated into teaching and education until 1975, when Apple released its first computer, Apple Computer 1, in 1975 and distributed units to classrooms in the USA (Cox, 2013). By the 1980s, however, personal computers had become a common educational tool one used in classrooms to enhance and augment the existing teacher–student method of teaching (Cox, 2013). The impact of ICT on educational instructions such as universities was not purely educational however, and computers soon became the preferred method for cataloguing and conducting administrative tasks, with their use within library systems providing a good example (Cox, 2013).

With the development of computers and their computational power, the scope for ICT technologies and their use within education increased as well (Panda & Mishra, 2007). Since the 1990s, ICT technologies have offered a broader array of educational solutions; the means by which students and teachers alike could implement and utilise ICT in the classroom become increasingly common and varied. Educators started to adopt ICT in their classroom, learning approaches started to include computer games, educational software programs (Panda & Mishra, 2007) and, as the 1990s ended, the Internet to increase informational availability to their students (Cox, 2013). According to Panda and Mishra (2007), E-learning as a phenomenon only "caught the imagination of educators" with the increasing use and prevalence of the World Wide Web.

Today, the impact of the internet and World Wide Web is ubiquitous; students and learners often carry their own personal computers in the form of smartphones and laptops. Students can learn at any time or place using these devices (Cox, 2013), whether they are on a field trip, at home, or in the classroom, something that educators and pioneers of E-learning solutions and approaches have started to utilise. E-learning continued to evolve both in and alongside the internet. After the development of what has since been dubbed 'WEB 2.0', E-learning solutions have begun to concentrate on social learning and the use of social software, including discussion forums, wikis, online chat, blogs, Blackboard 9.1 and other virtual environments and system, for different educational purposes. The following section considers E-learning in relation to various pedagogical approaches as perceived in the extant literature, indicating how E-learning has been incorporated into established educational models.

2.2 E-learning and its place in educational practice

E-learning can be defined as any technology used to enhance or facilitate the learning process through interaction with digital services, aid or content (El-Ghareeb, 2009). The uses and implementations of E-learning are broad and complex; nevertheless, El-Ghareeb (2009) proposed three recognised educational models: traditional learning, distance learning, and hybrid learning. Details of these are given below:

- Traditional learning. Traditional learning takes place within the classroom and involves face-to-face interactions between the student and the teacher. According to Al-Ismaiel (2013), this educational model is preferred by most higher-education students in Saudi Arabia
- Distance learning. Distance learning is learning that takes place without any specific time or location. Consequently, both synchronous and asynchronous methods may be used by educators and their students as part of a distance learning approach (El-Ghareeb, 2009)
- Hybrid learning can be defined as the incorporation of technology with traditional methods in classroom-based educational processes. As a result, the technology becomes just one aspect of the learning process (Al-Qahtan & Higgins, 2013). The essential characteristics of hyper-learning according to Alkhan (2005) may be able to increase the effectiveness of costly applications; furthermore, the integration of an array of varied skills and techniques increases the overall efficacy of the programmes offered (Alkhan, 2005). Hybrid learning is also able to increase cooperation among members, between the educational programme and the learner according to their individual requirements; using a hybrid-learning model means that learners can adopt numerous approaches to education and educational materials, increasing the chance of them finding a particular solution that meets or satisfies their personal preferences (El-Ghareeb, 2009).

Of these, the hybrid model is best suited to E-learning programmes. However, it must be noted that, while historically hybrid learning programmes have seen limited use, their adoption has grown in line with rapid technological progress in developed countries. Nevertheless, certain challenges remain in relation to hybrid learning's adoption in developing countries that are relevant to the Saudi Arabian context, despite its utility.

2.2 The significance of E-learning and its adoption by Saudi Universities

The integration of E-learning technology is a significant concern for any developed or developing nation; however, the integration of E-learning into higher education is of

particular importance to Saudi Arabia. According to previous research in the field, the significance of introducing ICT into higher-education teaching practice is threefold (Alshathri & Male, 2016; Alghtani, 2017). Firstly, university education is in high demand in Saudi Arabia, with the number of prospective students being larger than the number of places available. Thus, it is difficult for universities to accommodate all these students. However, with the possibility of remote learning facilitating the successful integration of E-learning into teaching practice, this issue may be alleviated or even solved. Secondly, for certain subjects taught in universities in Saudi Arabia, lectures and lesson times are short. This is especially true for applied sciences and medical courses. Again, the opportunities provided by E-learning in the way of remote and hybrid learning practices can help to resolve or address this problem. The third reason is cultural and religious in nature and—though not unique to Saudi Arabia—is of particular importance because of these reasons. Education in Saudi Arabia is segregated according to gender, and it is not permitted for male educators to teach female students (Ministry of Education, 2017). Hence, numerous difficulties arise when the student and the teacher are of a different gender. E-learning may help to address this matter as male teachers are now able to teach female students, for example by videoconferences or other technologies such as Blackboard. Therefore, ICT solutions have been introduced into the teaching and learning curricula and practiced by many universities in Saudi Arabia. Despite of the advantages of ICT in educational environments, particularly in the university context, teachers' utilization of ICT in Saudi institutions is very rare, with only a few teachers having utilised it. As a result, this research will highlight the most important factors impacting on the utilization of ICT in the teaching process, especially in Saudi Arabia.

A peripheral advantage of integrating ICT solutions into education, especially higher education, is the opportunity it provides to increase the educational channels and quality-of-life for disabled individuals (Koc, 2005). Remote access to educational content and remote learning solutions allows these individuals to live more autonomous and independent lives (Hong & Songan,2011). Furthermore, due to the prevalence of ICT in the professional and corporate world, other advantages E-learning students include increased proficiency with ICT solutions and programmes even after they have left education. ICT itself becomes a tool through which learners who have been educated through E-learning can solve problems, discover new subjects and content, as well as utilise their learning in their future professional lives (Brush, Glazewski & Hew, 2008). Not only does E-learning introduce a new way of learning to students, it also educates them on how to use ICT itself both in education and after in

the form of search engines, graphics software, databases, word processing and search engine skills (Fu, 2013).

3. Methodology

As mentioned above in the aims and objectives section, the literature reviewed was predominantly concerned with Saudi Arabia's University teaching environment and E-learning in practice, although research on other educational systems has also been included. Ultimately, 32 relevant pieces of research were found during the literature search, with the various studies listed in Appendix 1. The literature was found by the author through a search undertaken via the university library database, using key search terms such as 'Saudi Arabia', 'ICT', 'E-learning', 'higher education' and 'university'. These were combined during the search to narrow down the relevant literature, with all of the identified resources also analysed in turn to ensure their appropriateness to the study. Having identified the 32 relevant studies for the literature review, the texts were then appraised to identify the key factors that emerged that were found to affect and influence academic staff's adaption of ICT in education and E-learning techniques. The three main factors that were identified as most prominent in the field's extant literature are a lack of time, lack of training and lack of institutional support. The relevant studies that identified these main factors are indicated in Appendix 1. The following sections will appraise the literature that has identified lack of time, lack of training and a lack of institutional support as the key factors.

4. Adoption and integration of E-learning into teaching practice

This section reviews the three main factors influencing E-learning's adoption by university staff in Saudi Arabia, according to the literature reviewed: 'Lack of Time', 'Lack of Training' and 'Lack of Institutional Support'.

Specifically, this section will review relevant studies that found lack of time, lack of training and lack of institutional support to be the main and most important factors affecting educators' implementation of ICT in the teaching environment. These studies concern both Saudi and non-Saudi Universities, as well as Higher Educational and non-Higher Educational levels of teaching; however, all studies are relevant to this overview and its aim. The definition and concept of integration and adoption must first be established before those factors influencing ICT use and adoption by teachers and educators can be identified. Rogers (2010) defined the meaning of adoption as a choice made to utilise an innovation as the preferred course-of-action, a process that

commences with the initial learning of or encounter with a particular innovation and follows with its integration and practicable use.

Rangaswamy and Gupta, (2000) investigated the research opportunities concerning the adoption and diffusion of innovative ideas and practices, assessing the individuals concerned and their reactions and willingness to accept them. Though this study was not undertaken in an educational setting, the contribution it makes to existing research is important; the most significant being a connection between rate-of-change of the technology in question and the willingness to adopt new ICT solutions and practices. It is possible that educators will feel less motivated to adopt new technologies if they feel they may be obsolete or out-of-date soon after. Hence, an ongoing training and adoption policy is suggested regarding this issue.

4.1 Identification of Factors impacting educator's use and adoption of E-learning

According to the literature reviewed, there are many factors that affecting teachers' use of ICT in education settings. Stockdill and Morehouse's (1992) study highlighted the following characteristics concerning E-learning implementation: organisational capacity, content characterisation, characteristics of the user and technological characterisations. A further aspect, namely instructional support, was suggested by Neyland (2011), who looked at E-learning technologies in schools in Sydney, Australia. This factor also incorporates several micro-factors such as the skills and abilities of the teacher, and their influence on students when adopting and being proactive in learning with a new E-learning system.

The term 'education technology' is used by Sherry and Gibson (2002) in their study on teacher leadership and reaction to integrated E-learning solutions. The authors devised two frameworks in their study by which this can be realised. One of these is the "Systematic Sustainability" model, which corroborates the findings of this review, namely that ongoing support is required after the initial introduction of new E-learning solutions to ensure teacher utilisation and effective practice. Further, the authors concluded that "new research and development projects" will serve to demonstrate these models in practice, again echoing the speculative and trials nature of innovative teaching practices and tools and that individual, organisational, technological and institutional factors are all significant.

Further factors were subsequently suggested by David (1993), who propounded the TAM theory based on the Technology Acceptance Model (TAM). Herein the perception of use and perceived usefulness of technology was highlighted as a major factor concerning that technologies' infraction and adoption by the user. Further factors such as time, the nature and characteristics of the technology itself, costs incurred, age,

teacher experience, teacher interest, training, beliefs and convictions of the teacher, institutional support, technical issues, attitudes, gender and workload were common to numerous studies (Albirini, 2006; Mahdizadeh et al., 2008; Sun, Tsai, Finger, Chen & Yeh, 2008; Al-adwan & Smedley, 2012; Almulhem, 2013; Al-Enaz, 2016). However, this research will discuss just three major factors: lack of time, lack of training and instructional support which were common to a majority of the literature consulted.

4.1.1 Lack of Time

The first main factor identified was 'lack of time'. Institutions are required to invest time and resources into developing E-learning and teaching practices, which is especially true in Saudi Arabia as part of the 'Saudi vision 2030' (Minister of Education, 2017). One study found that, to achieve this, universities had to respond to student feedback and inquiries (Wagner, Hassanein & Head, 2008). Doughty, Spector and Yonai (2003) found that instructors spent twice the number of hours delivering their E-learning courses, whereas they need less time compared to traditional teaching methods and practices. Similarly, Pelgrum's (2001) research aimed to examine and investigate those barriers affecting ICT use in the teaching and learning process. The sample consisted of 26 countries. The results revealed that 54% of participants agreed that they did not have enough time to adapt and utilise technology into their teaching process in their classroom. Schifter (2000) added that teachers' lack of time in terms of preparing online courses was a major barrier for adopting ICT in education. According to some researchers (Tearle, 2003; Jones, 2004), the major factor concerning the integration and adoption of ICT solutions in teaching practice was 'time available', which has delayed the adoption of ICT in the education and learning process.

Hew and Brush (2007) conducted a literature review of US studies from 1995–2006 concerning the integration of technology into K-12 teaching and learning, identifying the barriers encountered to inform future research. Among the conclusions of the study was that educators required huge amounts of time to collate the necessary information and resources from the internet for use in E-learning programmes. The efficacy and expediency of this research relied on the individual educator and their project. Therefore, training in this domain would have expedited this preparatory work by educators when conducting internet research, highlighting once again the multifaceted nature of E-learning training given that even preparatory work demanded training. Several key knowledge gaps were identified in the study, of which time for training and preparatory work was significant. An assessment of ICT implementation in Hong Kong Primary Schools and the perspectives of teachers and Primary head teachers concerning ICT integration in teaching practice was undertaken by Wong

(2005). The study found that planning and preparation were key in successful ICT integration and that limited resources had a direct impact on ICT integration and use, regardless of the willingness of teaching staff concerning. Here it can be seen that, even with the most proactive and willing staff, ICT integration is only possible with sufficient time and training.

Brich and Burnett (2009) conducted a study at the University of Southern Queensland which examined those factors affecting the incorporation of technology by teachers and instructors. The findings showed that a lack of time was the primary obstacle dissuading participants (teachers) from designing E-learning courses and employing E-learning technology in their teaching. Moreover, Cahillane, Smy and MacLean (2016) found that lack of time affected teachers adoption of ICT because preparing E-learning materials was hugely time consuming. Finally, a 'lack of time' was also mentioned by Bernárdez (2003) as a main factor impacting teachers' adoption of E-leaning solutions.

In the kingdom of Saudi Arabia, the implementation of ICT in teaching and learning processes echoed and even amplified 'lack of time' as a hindering factor. Several studies conducted in the Saudi Context revealed through their results that educators had insufficient time to attend attending training courses and E-learning design online, which affected and influenced the adoption and use of ICT in teaching practice. For example, Alhazzani's (2013) study found that instructors could not attend E-leaning training courses at all because of time restrictions. Al-Amari (2011) and Al Mulhim (2014) found that teachers in Saudi Arabia usually worked 18 hours every week with lectures lasting an average of 45 minutes, something that brings this factor into question; the additional extracurricular demands were not counted however, whereas these may have provided a significant justification for lack of time. Additional research undertaken by Almuqayteeb (2009) found out that insufficient time for adapting technology in teaching affected the implementation of ICT by teachers. Al-Malki 2013 found the same result in his study. Al-Balawi (2007) investigated the factors that affected and prevented educators from using and adopting web-based instruction during their teaching. The research revealed that an essential factor affecting educators' adoption and employment of this kind of technology was insufficient time. Moreover, Alahmari and Kyei-Blankson (2016) determined that a lack of time and limited teachers' use of E-learning during the teaching process prevented them from attending training courses. In a recent study by Alshammari (2015) lack of time was highlighted alongside many other factors such as workload limitations, which affected educators' adoption of Learning Management Systems in the education and learning process.

Research by Alsulaimani (2012) found that 91% of all participants—female Saudi science teachers—believed a "lack of time to be the strongest barrier" to E-learning integration. More recently, Quadri et al. (2017) conducted a study in some Saudi Universities. This study sought to investigate the factors and barriers affecting the use of technology during teaching and learning process. A questionnaire was adopted as the data collection tool, with a sample comprising of 257 participants. The results revealed that lack of time for developing E-courses had the highest mean (3.70), thus positioning it as the foremost factor hindering and affecting the adoption of ICT during the teaching process in Saudi Arabia Universities. Furthermore, recent research by Al-Gamdi and Samarji (2016) mentioned lack of time as a factor affecting faculty members' utilisation and adoption of ICT, with a mean of 3.06.

4.1.2 Lack of Training

The second main factor was 'lack of training'; faculty members to effectively implement technology during the teaching process, institutions should provide sufficient training courses (Jones, 2004). Panda and Mishra (2007) complained that one major factor preventing the successful adoption of ICT in teaching by instructors was the lack of training in how to implement ICT in teaching. The literature review and many previous studies have indicated that a lack of training, or the provision of insufficient practical training, is a key variable affecting academic staff members' use of ICT in teaching. Jurado (2013) undertook research with seventeen teachers in 2006 and again in 2011. The study focused on investigating the impediments that teachers faced while integrating technology into their teaching. The researcher used interviews as a tool for data collection. The researcher found that the teachers' attitudes towards technology had not changed significantly, which was largely due to there being many elements influencing teachers' adoption of ICT during lessons. The important elements highlighted were a lack of training and incentives. Subsequently, the researcher suggested that institutions should provide sufficient training and encourage teachers to use ICT by providing them with rewards and incentives.

Research into those factors affecting E-learning's adoption and implementation within the Jordanian Higher Education system was undertaken by Al-Adwan and Smedley (2012). The authors focused on full-time students and staff members, analysing these individuals in relation to the impact of E-learning and ICT. It was apparent that modern life had pressurised higher educational institutions into adopting and utilising ICT and E-learning for their curricula and teaching practices. Furthermore, the study concluded that Higher Educational institutions approached and utilised E-learning as a factor for maintaining their competitiveness in a dynamic and global marketplace, with

cross-cultural and international links facilitated and homogenised through E-learning (Al-Adwan & Smedley, 2012). The study concluded that, in order for E-learning to be effectively introduced into teaching practice, Faculty staff and students both need considerable levels of support to prepare for the implementation of E-learning and to ensure that they are supported effectively throughout their own learning journeys. (Al-Adwan and Smedley, 2012). This emphasises that, not only should preparations be made for effective introduction but that, furthermore, this preparatory work continues post-implementation and is sensitive to the particular and singular demands of individual students. This preparatory work should include training of faculty members and appropriate training for students who lacked the relevant ICT skills and abilities. This support, per the demands and feedback received in the study, was to continue post-implementation and include demonstrative and supportive ongoing training for users of the new E-learning system. Additionally, "self-motivation" was identified as a major factor in students' reception of new E-learning systems, something that could potentially be aided by an educator's ability to persuade and encourage the students to proactively utilise it; it is suggested that this be included in the 'teacher training' aspect of this factor. Finally, the two universities' organisational structures proved to be the most significant barrier to the introduction of the E-learning programmes. However, this conclusion concerned student training more than teacher training, thus has limited significance to this overview. Similarly, Elzawi and Wade (2012) conducted research in Libya, with the results identifying a lack of training and insufficient English language to be among other variables influencing and preventing teachers' use of ICT in the classroom.

Within the Saudi context, several studies have found equivalent results with those of the above studies, indicating that insufficient training is reflected in ICT's adoption for teaching in many Saudi universities, while playing an important role in ICT's successful implementation in the university teaching process. For example, Al-Gamdi and Samarji (2016) investigated faculty member's perceptions of the factors and barriers affecting their adoption of ICT during their daily teaching. They adopted a questionnaire with a 214-person sample, comprised of both male and female faculty members. The study results indicated that there an array of factors and barriers can affect and influence the use of ICT during the teaching process; among these elements was a lack of training with a mean of 4.13, which was the highest mean among the variables. Alshamari and Higgins (2015) examined the obstacles and elements preventing faculty members from adopting ICT during their teaching. To collect the data, a questionnaire was used with a 375-member sample of faculty staff. The participants cited that lack of training in relation to integrating ICT into teaching was

the second most significant factor preventing them from adopting technology themselves. Similarly, a lack of training in E-learning was cited by teachers in Quadri et al.'s (2017) research. Likewise, El Zawaidy (2014) investigated Saudi universities in relation to their aim of investigating barriers facing faculty members in using the Blackboard system. Their results determined that insufficient training and poor infrastructure were affecting educators' adoption of blackboard during the delivery of E-courses. Moreover, Al-Jarf (2007) found that teachers' use of online learning was detrimentally affected by insufficient training. Almuqayteeb (2009) identified that a lack of practical training influenced and prevented faculty members from adopting ICT in their teaching. The researcher indicated that teachers' adoption of technology was solely reliant upon PowerPoint slides. She suggested that if a university wishes to implement technology successfully, it must provide sufficient training to their educators. Further to this research, both Al-Asmari (2011) and Al-Harbi (2014) mentioned that a lack of effective training for academic staff deterred them from integrating new technology in their courses.

4.1.3 Lack of Institutional Support

According to Mumtaz (2000), poor institutional support is a significant factor in hindering teachers' willingness to adopt and utilise ICT solutions during their educational practice. Likwise, Al-Shehri (2010) indicated that lack of technical support deters faculty members from adopting ICT education solutions in their teaching. Additional researchers have suggested that administrative support can be a crucial element in successful adoption of ICT (Brzycki & Dudt, 2005).

In the Kingdom of Saudi Arabia, despite considerable funding from the government in order to facilitate ICT's adoption in the learning and educational process, a dearth of institutional support has been identified by various scholars as a crucial factor hindering faculty members' use and adoption of ICT in the educational environment (see Appendix). For example, Algahtni (2017) suggested that educators' adoption of Blackboard in their teaching curricula yielded significant results. Primary factors identified by the participants (educators) included: 'lack of incentives to support the adoption of the LMS'; 'lack of institutional support'; 'poor encouragement [to adopt the Blackboard tool]] for teachers'; 'poor internet network services'; 'technical problems'; 'system failures'; 'lack of access to technology'; 'software problems', alongside a 'lack of technical support for both teachers and students' (Algahtni, 2017). All these factors are reliant upon the assistance and support of the institution in question, at both the initial stage and in an ongoing manner for teachers and students.

Al-Megren and Yassin (2013) noted one reason that has made technology difficult to implement has been a lack of access to technology in Saudi institutions, while they also emphasised that certain Saudi universities still lack wireless connection to the internet, or it is of poor quality. Recently, Al-Enazi (2016) carried out research that sought to investigate educators' perspectives of actual and desired support within their institutions. Their investigation was conducted across five public universities with a sample of 518 male and female teachers. The researcher adopted a mixed method approach in order to collect the data. Their study findings indicated that the five public institutions rarely provided technical support, technical training or institutional incentives, with a mean of 2.29. Al-Enazi proposed that the faculty members' adoption of technology during the educational process was influenced by the degree of institutional support. Similarly, Alaugab (2007) identified that poor institutional support was the second most important factor affecting academics' use of ICT during the teaching and learning process. Additionally, Al-Jaref (2007) suggested that poor institutional support, for example a lack of funding for implementing ICT and insufficient rewards for teachers, did not result in successful adoption of ICT within an educational context. Furthermore, Almulhem (2013) undertook research at one university in Saudi Arabia, with the results indicating that heavy workload, lack of financial support, administrative support and technical support were all important factors that could affect faculty members' adoption of ICT within the academic environment. Moreover, Almuqayteeb (2009) achieved the same results in their research. Alshamari and Higgins (2015) added that academics staff in Saudi Arabian universities suffers from insufficient institutional support. This issue was also mentioned by El Zawaidy (2014).

The importance of ICT in the workplace has been repeatedly highlighted by academics, along with its inclusion in universities, where electronic means of communication are being employed for teaching and learning. This can improve students' capacity to learn and solve problems, while also improving organisational performance. These in turn all rely on sound infrastructure and effective understanding of how the ICT system should be deployed in a university context.

5. Discussion and Conclusions

Many studies have claimed that adoption and use of ICT solutions in the educational environment can help and improve the teaching process. However, there are only a few Saudi University teachers who have opted to utilise or employ it as an aspect of their teaching practices. Resultantly, having knowledge of the primary factors and elements

by reviewing and highlight the major factors such as lack of time, lack of training and institutional support that could affect and influence the adoption and implementation of ICT in education and learning practical process by educators are crucial. After reviewing and presenting the previous studies it is clearly seen that lack of time, lack of training and a lack of institutional support are affecting and influencing the process of adoption and utilisation of ICT in teaching process. If these elements are left unresolved, then instructors and teachers' adoption of ICT is likely to be limited. Consequently, Saudi Arabian institutions should create and develop ideal plans and strategies in order to address these factors.

The adoption of ICT in the educational systems of developing nations will differ from that of developed countries, and the criteria for successful integration shall vary between the two. The development and introduction of E-learning into Saudi Arabian University teaching practice and learning has failed to yield the anticipated results. Further, the level of introduction and assimilation of E-learning has been met with resistance and reluctance

Some confusion arises from the lack of awareness and prospective advantages yielded by developing and implementing ICT solutions and E-learning programmes and related technologies into the educational establishment and its teaching practice and curriculum. However, per the recommendations and findings highlighted above it is hoped E-learning will be successfully be implemented into the higher Saudi Education system so long as sufficient training and time are afforded to teaching staff with, most significantly, the correct institutional support. Hence, an ongoing training and adoption policy is adopted by Saudi Universities to ensure that teachers feel included in new E-learning practices and that this inclusion will not become outdated if developments or new technologies emerge.

6. Limitations and suggestions for future research

Although understanding the literature in relation to the Saudi Arabian context is most important in terms of implementation of ICT and E-learning in the country, it may be worthwhile in consulting literature relating to other developing country contexts and carrying out similar literature reviews. This may be particularly useful as Saudi Arabia sees the increasing adoption of ICT and E-learning strategies, where the likely challenges arising at later stages could be anticipated by understanding other country contexts.

Although the prominent factors affecting teachers' adoption of ICT are well established in the existing literature, it may be fruitful to engage further with higher

education teaching staff in the Saudi context in order to seek their perspectives on how best to remedy these challenges. This would also ensure their engagement and participation in the process of implementing E-learning in the institutions where they work.

Acknowledgments

I would like to thank my supervisor Prof Vic Lally for his helping, supporting, comments, guidance and participating in this paper.

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Appendix

Studies consulted arranged per 'main factor impacting teacher's adoption of E-learning'

Table 1: Studies included in this overview according their 'main factor' impacting educator's adoption of E-learning systems and ICT educational solutions

Factors affecting teachers use ICT (main factor)	**Studies consulted**
'Lack of Time'	Schifter, 2000; Pelgrum, 2001; Doughty, Spector & Yonai, 2003; Tearle, 2003; Jones, 2004; Wong, 2005; Hew & Brush, 2006; Al-Balawi 2007; Wagner, Hassanein & Head, 2008; Brich & Burnett. 2009; Almuqayteeb, 2009; Alhazzani 2013; Al-Malki, 2013; Alshammari, 2015; Al-shammari, 2015; Alahmari and Kyei-Blankson, 2016; Al-Gamdi & Samarji, 2016; Cahillane, Smy & MacLean, 2016; Quadri et al., 2017
'Lack of Training'	Panda & Mishra, 2007; Al-Jarf 2007; Almuqayteeb, 2009; Al-Asmari, 2011; Elzawi & Wade, 2012; Al-adwan & Smedley, 2012; Jurado, 2013; Al-Harbi, 2014; El Zawaidy, 2014; Alshamari & Higgins, 2015; Al-Gamdi & Samarji, 2016; Quadri et al., 2017
'Lack of institutional support'	Al-Jaref, 2007; Al-Jaref, 2007; Almuqayteeb, 2009; Al-Megren & Yassin, 2013; Zawaidy, 2014; Alshamari & Higgins, 2015; Al-Enazi, 2016; Algahtni, 2017